Claims

[c1]   1. A method for minimizing area of a circuit design, the method comprising the steps of:

applying a longest path algorithm to the circuit design to determine a minimum legal size;

calculating a scaling factor based on a ratio of the minimum legal size divided by a pre-compaction size; and

scaling the circuit design using the scaling factor while maintaining an objective.

[c2]   2. The method of claim 1, wherein the minimum legal size and the pre-compaction size are measured from a boundary to an opposite boundary.

[c3]   3. The method of claim 1, further comprising the step of fixing an element size prior to the longest path algorithm applying step and the scaling step.

[c4]   4. The method of claim 1, wherein the longest path algorithm applying step includes assigning of a sink and a source only.

[c5]   5. The method of claim 1, wherein the longest path algorithm applying step includes ignoring selected design

constraints in the case that the longest path algorithm cannot be completed due to a positive cycle.

[c6] 6. The method of claim 1, further comprising the step of fixing an element size prior to the scaling step such that the element size does not change during the scaling step.

[c7] 7. The method of claim 6, wherein the element includes one of a device and a wire.

[c8] 8. The method of claim 1, wherein the step of maintaining includes applying a minimum perturbation analysis to the scaled circuit design to correct a ground rule error in the scaled circuit design.

[c9] 9. The method of claim 1, wherein the objective includes at least one of: a distance between elements, alignment of elements, a size of an element, relative positions of elements, and an overall pattern of an un-compacted circuit design.

[c10] 10. A system for minimizing area of a circuit design, the system comprising the steps of:

means for applying a longest path algorithm to the circuit design to determine a minimum legal size;

means for calculating a scaling factor based on a ratio of the minimum legal size divided by a pre-

compaction size; and

means for scaling the circuit design using the scaling factor while maintaining an objective.

[c11]   11. The system of claim 10, wherein the minimum legal size and the pre-compaction size are measured from a boundary to an opposite boundary.

[c12]   12. The system of claim 10, wherein the longest path algorithm applying means ignores selected design constraints in the case that the longest path algorithm cannot be completed due to a positive cycle.

[c13]   13. The system of claim 10, wherein the scaling means further includes means for conducting a minimum perturbation analysis to the scaled circuit design.

[c14]   14. The system of claim 10, further comprising means for fixing a size of an element in the circuit design prior to scaling such that the element size does not change during scaling.

[c15]   15. A computer program product comprising a computer useable medium having computer readable program code embodied therein for minimizing area of a circuit design, the program product comprising:

program code configured to apply a longest path algorithm to the circuit design to determine a mini-

mum legal size from a boundary to an opposite boundary;

program code configured to calculate a scaling factor based on a ratio of the minimum legal size divided by a pre-compaction size from the boundary to the opposite boundary;

program code configured to scale the circuit design using the scaling factor; and

program code configured to apply a minimum perturbation analysis to the scaled circuit design.

[c16]   16. The program product of claim 15, wherein the longest path algorithm applying program code applies the algorithm with assigning of a sink and a source only.

[c17]   17. The program product of claim 15, wherein the longest path algorithm applying program code ignores selected design constraints in the case that the longest path algorithm cannot be completed due to a positive cycle.

[c18]   18. The program product of claim 15, wherein the scaling program code fixes a size of an element in the circuit design prior to scaling such that the element size does not change during scaling.

[c19]   19. The program product of claim 15, wherein the

longest path algorithm applying program code fixes a size of a gate in the circuit design prior to applying the longest path algorithm, wherein the scaling program code maintains the fixed size during scaling.

[c20]   20. The program product of claim 15, wherein the minimum perturbation analysis applying program code corrects a ground rule error in the scaled circuit design.